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Norwalk Virus, Noroviruses and Viral Gastroenteritis

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Recent outbreaks of gastroenteritis on cruise ships have drawn the attention of the news media and have caused a great amount of concern among prospective cruise ship passengers. Between July 2002 and November 2002, the Centers for Disease Control and Prevention (CDC) investigated several cruise ship outbreaks of viral gastroenteritis involving several hundred passengers and crewmembers. In each case Norwalk-like viruses (NLVs) were identified as the etiologic agent. NLVs are a major cause of sporadic acute gastroenteritis (AGE).

The Norwalk virus gets its name from a 1968 outbreak in Norwalk, Ohio, and is the prototype strain of a group of single-stranded RNA viruses now called "noroviruses." Noroviruses are the leading cause of outbreaks of AGE in the United States. The CDC estimates that noroviruses cause approximately 23 million cases of AGE each year.

Clinical Aspects

Norovirus presents with acute vomiting and/or diarrhea, without a prodrome. Individuals exposed to the same strain of norovirus may have only vomiting or only diarrhea. Other symptoms may include abdominal pain, headache and myalgia. Fever and chills are only reported in approximately one-third of cases. The incubation period is usually 24 to 48 hours (average of 36 hours) and illness typically lasts

from one to three days. These symptoms are the result of infection of the mucosa of the proximal small intestine, damaging the microvilli, and causing malabsorption of D-xylose, lactose, and fat. Although no histopathological lesions can be found in the stomach mucosa, the virus causes abnormal gastric motility and delayed gastric emptying. The virus does not invade the colon and, therefore, does not cause fecal leukocytes or hematochezia. Illness is usually mild and self-limited but can be severe, especially in people with group O blood type and in children, the elderly, and those with underlying conditions who more easily develop significant dehydration. Treatment is supportive.

Laboratory confirmation of norovirus infection is not routinely available. Current methods involve electronmicroscopy, serology and polymerase chain reaction (PCR). New antigen detection assays are under development.

Upon recovery from the illness, individuals may develop immunity to the virus. However, since there are usually many different norovirus strains circulating at any one time, re-infection can occur upon exposure to a different strain.

Epidemiology

Noroviruses can be transmitted by hands contaminated through the fecal-oral route, through contaminated food or water, directly from person to person, by contact with contaminated surfaces or fomites, or via aerosolized vomitus. A low infectious dose (<100 virus particles) and stability in the environment contribute to high infection rates. Secondary cases in outbreaks are common. In addition, patients can continue to shed the virus for up to two weeks after their recovery. Approximately 1/3 of infections are asymptomatic.

Outbreaks of AGE due to noroviruses have occurred in many settings such as institutions, the military, day care centers, schools, camps, and football games. Contaminated food is the

most common initiating event, either by an infected foodhandler or, in the case of shellfish, harvesting in contaminated water. Foods that are not cooked, such as salads, cake frosting and raw oysters, are higher risk. Outbreaks associated with contaminated water are less common than those due to food. Water-borne outbreaks have involved wells, streams, municipal water, commercial ice, lakes and swimming pools.

Outbreaks of norovirus can be very difficult to control. Good hygiene practices, including thorough and frequent hand washing with soap and water, especially after using the toilet and before food preparation, is crucial. Additionally, prompt and thorough disinfection of contaminated objects and surfaces, especially in institutional settings such as day care sites and nursing homes, as well as on cruise ships, can help reduce the spread of the virus.

Suspected foodborne or waterborne outbreaks are reportable under California law. Reports should be directed to Orange County Health Care Agency Public Health Epidemiology at (714) 834-8180.

References

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Smallpox vaccination & possible adverse events

The initiation of Phase One of a national pre-event smallpox vaccination plan brings with it the possibility that individuals (public health and hospital response teams, military personnel) may present to their primary care physician, a clinic or other healthcare provider as a result of side effects from or an adverse reaction to the smallpox vaccination (vaccinia). A normal primary vaccination appears as a papule in 3-4 days, and rapidly progresses to a vesicle with surrounding erythema by the 5th-6th day. The vesicle center becomes depressed and progresses to a well-formed pustule (average size 12 mm) by the 8th-9th day. By the twelfth day, or soon thereafter, the pustule crusts over forming a brown scab, which progresses from the center of the pustule to the periphery. After 2.5 to 3 weeks, the scab detaches and a well-formed scar remains.

A range of symptoms are expected and usually occur about a week after vaccination. These include:

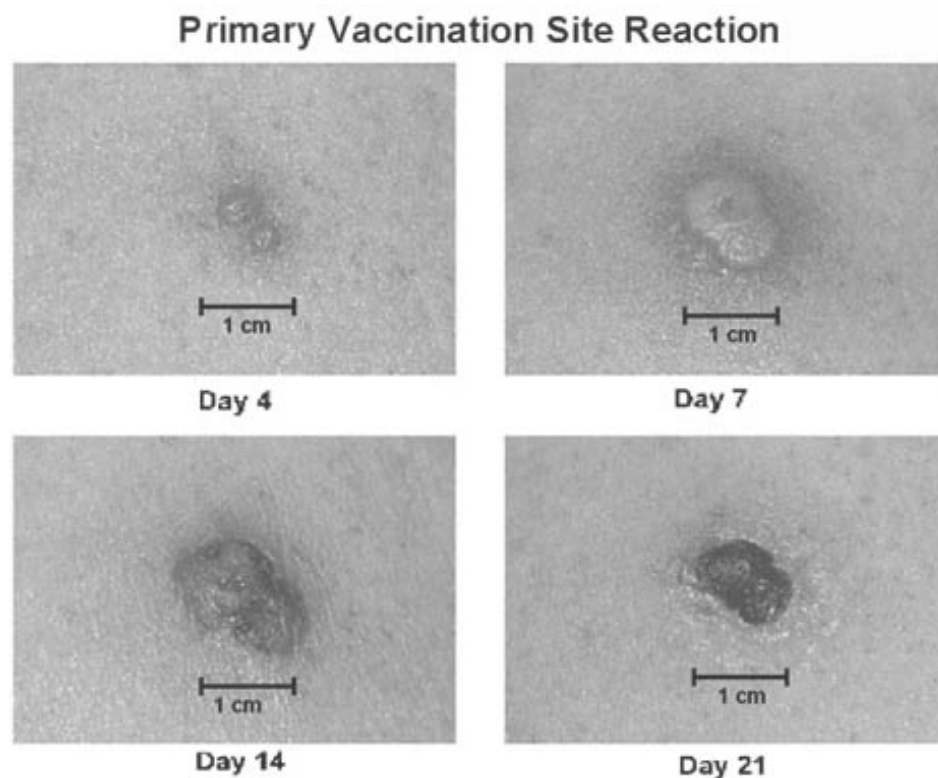
- Soreness at the vaccination site
- Intense erythema (viral cellulitis) ringing the vaccination site (16-24 mm is typical)
- Malaise
- Lymphadenopathy (local)
- Myalgia, headache, chills, nausea, fatigue
- Fever

The occurrence of these normal reactions varies considerably from study to study. The following table lists the symptoms covered by the studies and provides an indication of the range:

Lymphadenopathy	25-50%
Myalgia, headache, chills, nausea, fatigue	0.3-37%
Fever > 37.7° C (100°F)	2-16%

Nonspecific rashes are common 1 - 2 weeks after vaccination. The rash varies from erythematous macular lesions, to vesicles, urticaria, pustules and typical bulls-eye lesions, all under the rubric "erythema multiforme." These are benign lesions that do not progress. Itching may accompany the rash. The most serious hypersensitivity reaction, Stevens Johnson Syndrome (SJS), is rare.

Uncommon but usually benign reactions, such as generalized vaccinia, can also occur. Inadvertent inoculation (transfer of vaccinia virus from the vaccination site to another part of the body or another person) is usually benign but may require special care, particularly if the eye is affected or lesions are extensive. Rare but potentially life-threatening complications include eczema vaccinatum (in individuals with a history of eczema or atopic dermatitis), pro-



Source: The Centers for Disease Control and Prevention

gressive vaccinia (also called vaccinia necrosum, occurs primarily in persons with cellular immunodeficiency), and post-vaccinal encephalitis. Vaccinia Immune Globulin

(VIG) is used to treat some reactions (see Table 1). Requests for VIG should be made through Orange County Public Health.

The Centers for Disease Control and Pre-

(Continued on Page 3)

State sees gain in HIV reporting

The first year of California's regulations for mandated reporting of HIV infection has proven to be a challenge for health care providers, laboratories and the state, but recent reports show the number of cases being reported is on the increase.

According to the State Department of Health Services Office of AIDS, 9,155 unduplicated HIV cases had been reported by the end of December 2002. The State is also finding increased compliance with the accuracy and completeness of the information submitted. HIV reporting is intended to provide better epidemiological data for persons at all stages of the disease, define the incidence rates and trends for HIV and demonstrate the impact that HIV has on the health care system. In Orange County, HIV and AIDS cases are reported to the Orange County Health Care Agency AIDS Surveillance and Monitoring Program. Tests indicative of HIV infection that trigger the re-

porting requirement include, but are not limited to, HIV antigen, HIV antibody and quantitative HIV (viral load) tests. HIV reporting does not replace AIDS case reporting procedures and new AIDS cases must still be reported using previously established procedures.

Orange County's AIDS Surveillance and Monitoring Program provides assistance to health care providers in understanding the HIV reporting process. The program can be reached at (714) 834-8131. The State Office on AIDS website, <http://www.dhs.ca.gov/AIDS/>, includes the complete HIV reporting regulations, a list of Frequently Asked Questions about HIV reporting and tools such as software to assist in generating the "Soundex" that is part of the non-name code that must accompany the report. There is even an on-line course available to provide training in HIV reporting by non-name code.

Smallpox (Continued from Page 2)

vention (CDC) has resources for healthcare providers, including a web site dedicated to smallpox vaccination and adverse events. The site includes many diagnostic images illustrating key features with links to more detailed text. Clinical management guidelines and aids are provided to help differentiate the more common, self-limiting adverse reactions of vaccination from those that are serious and may require intervention. Go to www.bt.cdc.gov/agent/smallpox to access the CDC smallpox information. The vaccination and adverse events module is located at: <http://www.bt.cdc.gov/training/smallpoxvaccine/reactions/default.htm>. The CDC's Morbidity and Mortality Weekly Report (MMWR) has also published a guide on Smallpox Vaccination and Adverse Reactions, which can be found at <http://www.cdc.gov/mmwr/pdf/wk/MMWRDispatch1-24-03.pdf>.

All adverse reactions listed in Table 2 (*at right*) must be reported to Orange County Public Health at 714-834-8180.

State announces KI distribution plan

The Governor's Office of Emergency Services has announced a plan to offer potassium iodide (KI) tablets to all residents and workers in the Emergency Planning Zone around the San Onofre Nuclear Generating Station, which encompasses the cities of Dana Point, San Clemente and San Juan Capistrano.

The plan was developed in conjunction with health and emergency management officials in Orange and San Diego Counties, as well as San Luis Obispo County, where the State's other nuclear power plant is located. An information packet will be mailed to each residence and business in the designated areas, providing information about KI and the ordering of the tablets. Supplies of KI will also be maintained near the power plants for distribution should an actual incident involving the release of radioactive iodine occur. Individuals can buy additional supplies of KI from FDA approved vendors.

The State's message to the public emphasizes that evacuation or sheltering in place are the most effective means of protection during a nuclear power plant emergency. Additional information on the KI program is available on the Office of Emergency Services website at www.oes.ca.gov or through a recorded information line at 1-800-550-5234.

Table 1.

VIG Administration

Indicated

- Autoinoculation (extensive lesions)
- Eczema vaccinatum
- Generalized vaccinia (if severe or recurrent)
- Progressive vaccinia (also known as vaccinia necrosum)

Not Recommended

- Autoinoculation (mild instances)
- Generalized vaccinia (mild or limited—most instances)
- Erythema multiforme
- Post-vaccinia encephalitis

Contraindicated

- Vaccinia keratitis (may produce severe corneal opacities)

Table 2.

Adverse Events: Report to Orange County Public Health (714-834-8180)

Erythema multiforme
Auto-inoculation
Ocular vaccinia
Vaccinia keratitis
Generalized vaccinia
Eczema vaccinatum
Post-vaccinal encephalitis
Progressive vaccinia
Other—acute anaphylaxis, bacterial superinfection, unexpected events

Normal Variants: Not to be reported

Inflammation (erythema, edema, induration)
Satellite lesions
Lymphangitis
Lymphadenopathy
Systemic symptoms such as fever, malaise, myalgias
Tape rash (reactions to adhesives)

Public Health disclosures allowed under HIPAA privacy rule

While the Privacy Standards of the Health Insurance Portability and Accountability Act (HIPAA) take effect April 14, 2003, the HIPAA Privacy Rule recognizes the legitimate need for public health authorities and others responsible for ensuring public health and safety to have access to protected health information (PHI).

According to the U.S. Department of Human Services Office of Civil Rights, "The Privacy Rule permits covered entities to disclose protected health information, without authorization, to public health authorities who are legally authorized to receive such reports for the purpose of preventing or controlling disease, injury or disability. This would include, for example, the reporting of a disease or injury; reporting

vital events, such as births or deaths; and conducting public health surveillance, investigations or interventions." Examples of a public health authority under these guidelines include State and local health departments. The rule also allows a covered entity to disclose PHI to a person who is at risk of contracting or spreading a disease or condition if other law authorizes the covered entity to notify such individuals as necessary to carry out public health interventions or investigations.

The section of the HIPAA Privacy Rule dealing with Disclosures for Public Health Activities is found at 45 CFR 164.512(b) and the complete text of the Privacy Rule, along with other useful information, is available at <http://www.hhs.gov/ocr/hipaa/>.

DISEASE	Year End (Weeks 1-52) Number of Cases by Year of Report			
	2002	2001	2000	1999
AIDS	267	264	322	307
AMEBIASIS	18	24	18	19
CAMPYLOBACTERIOSIS	294	262	314	246
CHLAMYDIAL INFECTION	5629	5757	4575	4893
CRYPTOSPORIDIOSIS	9	6	1	8
E-COLI O157:H7	17	13	30	11
FOOD POISONING OUTBREAKS	72	37	15	23
GIARDIASIS	127	170	216	231
GONOCOCCAL INFECTION	686	664	568	572
H-FLU, INVASIVE DISEASE (<30 y)	4	3	5	4
HANSEN'S DISEASE, LEPROSY	0	0	2	1
HEPATITIS A (acute)	91	146	245	267
HEPATITIS B (acute)	48	48	58	55
HEPATITIS B (chronic)	1399	1530	1780	1545
HEPATITIS B (perinatal, acute & chronic) ¹	8	n/a	n/a	n/a
HEPATITIS C (acute)	10	10	4	13
HEPATITIS C (chronic)	2166	2519	2715	2477
HEPATITIS OTHER/UNSPECIFIED	18	14	21	47
KAWASAKI DISEASE	16	16	17	18
LISTERIOSIS	15	12	13	9
MALARIA	17	12	15	13
MEASLES (RUBEOLA)	2	5	2	4
MENINGITIS, TOTAL	378	310	331	303
ASEPTIC MENINGITIS	319	271	262	238
MENINGOCOCCAL INFECTIONS	9	14	22	16
MUMPS	8	2	5	4
NON-GONOCOCCAL URETHRITIS	793	656	646	483
PERTUSSIS	102	21	18	51
PELVIC INFLAMMATORY DISEASE	62	59	68	23
RUBELLA	0	0	2*	0
SALMONELLOSIS	310	268	353	309
SHIGELLOSIS	177	138	197	180
STREP, INVASIVE GROUP A	57	31	33	31
SYPHILIS, TOTAL	329	233	215	236
PRIMARY	17	17	7	17
SECONDARY	14	22	21	18
EARLY LATENT	31	26	19	33
LATENT	3	8	5	5
LATE LATENT	260	159	152	157
CONGENITAL	4	1	10	4
NEUROLOGICAL	0	0	1	2
TUBERCULOSIS	230	278	246	246
TYPHOID FEVER, CASE	3	0	3	1

*Includes one congenital rubella case n/a=not available

¹ Previously included in Hepatitis B acute or chronic totals. Separate reporting started in 2002.

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